

**ARC Centre of Excellence for Engineered Quantum Systems  
2014 Annual Workshop Program**

**Crowne Plaza  
Coogee Bay, Sydney**

**Wednesday 3 December 2014**

**6:30pm – 9:00pm**     *Workshop Opening Dinner – Ocean View Court*

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**Thursday 4 December 2014**

**6:30 – 8:30**             *Breakfast – Blue Salt Restaurant*

**8:30 – 8:50**             Registration -Oceanic Ballroom Foyer

**8:50 – 9:00**             Welcome and Introduction  
*Professor Gerard Milburn - University of Queensland*

**Session 1**                **Chairman: Professor Gerard Milburn**

**9:00 – 9:30**             *Invited Speaker*  
Simulating an Interacting Quantum Gas with Superconducting Circuits  
*Professor Andreas Wallraff - ETH Zurich*

**9:30 – 9:50**             Testing Quantum Contextuality with Superconducting Circuits  
*Dr Pascal Macha – The University of Queensland*

**9:50 - 10:10**             Parity transition in 1D Josephson arrays  
*Dr Karin Cedergren – University of New South Wales*

**10:10 – 10:40**             *Invited Speaker*  
Manipulating mechanical and electrical quanta with parametric circuits  
*Dr Raymond Simmonds – NIST, Boulder*

**10.40 – 11:00**             *Morning Tea – Oceanic Ballroom pre function foyer*

**Session 2**                **Chairman: Dr Thomas Volz**

**11:00– 11:30**             *Invited Speaker*  
The Superconducting Flux Qubit Revisited  
*Professor John Clarke, University of California, Berkeley*

**11:30– 11:50**             Two and a Half Methods to Achieve Strong Coupling with Spins in Solids at Microwave Frequencies  
*Dr Maxim Goryachev – University of Western Australia*

11:50 – 12:10 Novel Quantum Phases in Triangular J1-J2 Heisenberg Magnets on a Cylinder  
**Seyed N. Saadatmand - University of Queensland**

12:10 – 12:30 *Observation of resonant optical forces in optically trapped nanodiamonds*  
**Dr Carlo Bradac - Macquarie University**

**12:30 – 2:00** *Lunch – Blue Salt Restaurant*

**Session 3** Chairman: Professor Mike Tobar

2:00 – 2:30 **Invited Speaker**  
Proposal for Monitoring and Engineering the Position States of Atomic Arrays in a One-Dimensional Waveguide  
**Professor Valerio Scarani – National University of Singapore**

2:30 – 2:50 Non-Abelian Anyons for Quantum Codes: a Phenomenological Model  
**Simon Burton - University of Sydney**

2:50 – 3:10 Strong Converse Bounds for Quantum Communication  
**Dr Marco Tomamichel- University of Sydney**

3:10 – 3:30 High-Precision Quantum Photonic Measurements  
**Martin Ringbauer - University of Queensland**

**3:30 – 4:00** *Afternoon Tea - Oceanic Ballroom pre function foyer*

**Session 4** Chairman: Professor Andrew White

4:00 – 5:00 **Three Minute EQuS Poster Presentations, see schedule**

5:00 – 7:00 Poster Judging & General Discussion  
**Complimentary Refreshments Served, Oceanic Ballroom**

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**Friday 5 December 2014**

**6.30 – 8.30** *Breakfast – Blue Salt Restaurant*

**Session 5** Chairman: Associate Professor Warwick Bowen

9:00 – 9:30 **Invited Speaker**  
Quantum Computations on a Topologically Encoded Qubit  
**Professor Rainer Blatt- University of Innsbruck**

9:30 – 9:50 Superfluid Helium Optomechanics  
**Dr David McAuslan - University of Queensland**

9:50 – 10:10 Quantum control of single photon states via a mechanical resonator  
**Sahar Basiri Esfahani- University of Queensland**

10:10 – 10:30 Deterministic Creation of Macroscopic Cat States using Optomechanics  
**Daniel Lombardo – Macquarie University**

**10:30 – 11:00** *Morning Tea - Oceanic Ballroom pre function foyer*

**Session 6** Chairman: Professor Halina Rubinsztein-Dunlop

11:00 – 11:20 Experimental Noise Filtering by Quantum Control  
**Harrison Ball - University of Sydney**

11:20 – 11:40 Dual Component 87Rb and 41K Bose-Einstein condensates in configurable optical potentials  
**Dr Tyler Neely - University of Queensland**

11:40 – 12:00 Progress in Simulation of Anyonic Systems  
**Dr Robert Pfeifer – Macquarie University**

12:00 – 12:20 Characterizing spatio-temporal correlations with Hong-Ou-Mandel dips  
**Alexander Buese – Macquarie University**

12:20 – 12:40 Taming non-completely positive maps  
**Associate Professor Alexei Gilchrist – Macquarie University**

**12:40 – 1:40** *Lunch – Blue Salt Restaurant*

**Session 7** Private Meeting

1:40 – 3.10 Discussion: The future of Quantum Technology  
**(Note: attendance to this meeting is by CI or COO invitation only)**

**3.10 – 3.30** *All workshop delegates reconvene for Afternoon Tea – Oceanic Ballroom pre function foyer*

**Session 8** Chairman: Professor Jason Twamley

3:30 – 3:50 Classical Weak Value of Gaussian states  
**Angela Karanjai- University of Sydney**

3:50 – 4:20 **Invited Speaker**  
Negative Quasi-Probability, Contextuality and the Power of Quantum Computation  
**Professor Joseph Emerson**

4:20 – 4:30 Closing- including announcement of Poster prize winners